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Recipes from the past

Highland textile dyes in 19th century Merina sources, with a translation of passages from the "Ombiasy"s manuscript"

Sarah Fee and Bako Rasoarifetra

1 In her comprehensive study of indigo dyeing throughout the world, Jenny Balfour-Paul (1998:1-2) sets the stage for our present article:

> " Until recently, most textile and carpet experts have focused their attention on weaving, embroidery and design. Even though colour is usually the first thing to strike the eye, and is the most definable and dominating aspect of a textile's beauty, the means of producing colour and creating coloured fibres have often been taken for granted... the manner in which colours have been obtained, processed and applied to all types of fibres throughout history increases the appreciation of textiles as well as being essential for the preservation of historic pieces. "

2 Dominique Cardon (2007) in *Natural Dyes* suggests additional compelling reasons for undertaking new studies of traditional dyeing. To this day, the chemical properties of many dyes made from plants – some currently threatened with extinction – have never been fully understood. Capturing this knowledge requires learning the detailed, step-by-step recipes of local practitioners, and these have often gone unrecorded. Finally, beyond any historic or academic value, natural dyes today are of great interest to many local weavers who are increasingly seeking to tap European and North American markets which prefer natural colors and ecologically sound products.

3 All of the foregoing observations hold true for Madagascar. While color creates the dominant and distinctive character of Malagasy textiles – from the rich brick-red *lambamena* to the delicately striped *arindrano* – anthropologists and art historians have generally neglected studies of dyes in favor of the loom and weaving mechanics. Others have been less remiss in recent years: Ethève's (2005) overview of the island's plant dyes reminds us that there are some 180 species – of which 65 are endemic – and Cardon (2007) has undertaken research on several specific dye sources, notably bongo. However, much remains to be done on both botanical and ethnographic levels, namely detailed regional field studies, as well as research into the ritual dimensions of Malagasy dye preparation, the limited evidence showing striking parallels to practices in Africa and Southeast Asia.

Finally, studies on local dye sources are of promise to the Malagasy weavers in those many regions which have been employing synthetic colorants or pre-dyed yarns for a half-century or more. Since 2000, the state and several NGOs have been promoting natural dyes in an effort to increase the appeal of the island's handweaving with international consumers.

4 In recovering Malagasy dye recipes, historic European accounts offer one valuable body of information. Until the invention of aniline colorants in the second half of the 19th century, " dyeing drugs " (for most also hold medicinal properties) were precious commodities. They inspired merchants to travel far in their pursuit and gave rise to trade routes linking much of the ancient world. Thus the earliest European voyagers to Madagascar, prospecting for economic opportunity, carefully inquired into the island's dyes sources. Later, especially in the French colonial era, trained botanists likewise paid special attention to the island's " useful plants " (Heckel 1910, Decary 1946), as did the state-run Ecole Professionelle in Antananarivo which supported an important textile section (Nogue 1900).

5 And yet, Europeans were not the only early authors to document this knowledge. So too did the Malagasy. Our article presents the dye recipes recorded in four sources written by Merina authors and/or in the Malagasy language before 1900. These formulae are of great interest for their early date, as comparative material for other published recipes, and for their details not found elsewhere. In several instances, they represent the sole known recipes. Particularly valuable is the " Ombiasy's manuscript, " a resource which textile scholars have thus far ignored and to which we give special attention. Written from 1864-1870 by a former diviner-healer (*ombiasy*) to Queen Ranavalona I, this manuscript includes lengthy passages on weaving and fiber preparation. A fter presenting the four sources and comparing their recipes to one another and to other historic accounts, the article provides a summary of the Ombiasy's dye recipes and then – in the spirit of capturing their precise technical details – presents a close English translation of his original text.

The Sources

6 A classic reference work known to all scholars of Madagascar is the *Tantara ny Andriana*, a collection of written manuscripts and oral histories concerning Merina history and culture collected in the 1860s by the R. P. François Callet ([1878] 1908). Counting over 1,000 pages, the *Tantara* is surprisingly laconic on weaving, dedicating only a few lines to dyeing, and making no mention of indigo. Its major textile passages concern the rearing of indigenous *Borocera* silk in Betsileo country and the making of cloth from mulberry *Bombyx* silk introduced to the island in the 1820s. For the latter fiber, imported dyes were the norm. The *Tantara* records that *Bombyx* filament was colored with " a red powder obtained from foreigners [*vazaha*] " (Callet 1908:935). Ellis (1838 I: 327) asserts that this was the case more generally: " A few native dyes are prepared in the country; but the chief part of those used by the people are purchased from European and Arab traders, and used with considerable skill in colouring the silks, cottons, and roffia cloth. " While this may have held true for Merina weavers producing for commercial sale, it appears that rural or smaller scale Malagasy weavers creating for domestic use relied on local dyes throughout the 19th century.[1] The *Tantara* does briefly discuss four such highland dyes.

7 Beyond the renowned *Tantara*, several works directly authored by 19th century Merina writers have been collated, translated, and published, better-known examples including the works of Rainitovo ([1878]1928) and Raombana ([1850] Ayache 1980). Several, however, continue to remain obscure and underutilized. Prime among these is a document known today as the " Ombiasy's manuscript. " Although published in its entirety in Malagasy in 1972 (Giambrone [1972]), only a small fraction has since been translated and scholars rarely make recourse to it. Akin to other 19th century Merina writings, the narrative treats diverse topics of local history and custom, including rituals, folktales and the reigns of early sovereigns. The work also devotes an entire chapter to weaving, the longest and most detailed description produced by any early author – Malagasy or European (see Fee forthcoming).

8 Little has come to light on the origins of the author or his manuscript. Notices by Jacques Dez (1962), Lucile Rabearimanana (1975, 1976, 1978), and Noël J. Gueunier (2000, 2002), prefacing their translations of select passages, remain our major guides to date. According to these scholars, two copies of the work exist, both formerly in the possession of Alfred Grandidier, Madagascar's renowned 19th century scientific explorer.[2] The first copy resides today in the library of the Muséum National d'Histoire Naturelle in Paris,[3] while the second is housed at the Académie Malgache in Antananarivo. Although the latter is peppered with spelling mistakes and thought to be a copy, it is nevertheless considered to be the more " complete " and served for Giambrone's publication. Variously denoted in the past as the " Manuscrits Hova " and " Manuscrits Merina, " the work is today commonly referred to as " le Manuscrit de l'Ombiasy " (the Manuscript of the Ombiasy).

9 Ombiasy means " diviner-healer, " but beyond his profession, the identity of this individual – including his name – remains unknown. A few precious biographical details provided by Grandidier in his *Bibliographie de Madagascar* indicate that the Ombiasy was noble (*andriana*) and resided in Antananarivo; that he was very old at the time he wrote the work; and finally that he was " one of the last surviving *ombiasy* of Ranavalona I, " the Merina queen who ruled 1838-1861 (Rabearimanana 1975:296). The writings themselves date from 1864-1870, to the reigns of Rasoherina and Ranavalona II. From a study of the manuscript's folktales, Noël Gueunier (personal communication) is led to believe that the Ombiasy was probably literate (i.e. did not dictate his work), trained in the British Missionary schools.

10 A third 19th century " Merina " source we employ here is an unsigned article simply entitled " Ny Aika " (" Indigofera "), which appeared in an 1877 volume of the *Mpanolotsaina* magazine.[4] Published by the London Missionary Society in Antananarivo in the Malagasy language, the *Mpanolotsaina* (" The Councilor ") was aimed at the large local Christian community. " Ny Aika " is a complex narrative promoting Christian virtues and national(ist) pride, with a lengthy prelude on the natural bounty of the island. It encourages highlanders to cultivate *Indigofera* and process it on a commercial scale. Providing step-by-step directions, it aims to both enrich the individual producer and generate prosperity and progress for the entire nation.[5] We have been unable to identify the author of " Ny Aika. " He may have been an educated Merina man, but it is more likely that he was a British missionary; the editors of the 1877 volume specifically identify themselves as *vazaha* (foreigners, Europeans) and indeed penned nearly all the articles in the early years of the magazine (Noël Gueunier, personal communication). In any event, the author emphasizes that he " carefully questioned " (*nofotopotoranay tsara*) how

“ people here ” (*olona aty*) produce the dye. The recipe’s similarity to another recorded version (see below) vouchsafes its reliability. Although concerned solely with fabricating a storable form of indigo (and not dyeing fibers with it), this recipe adds several interesting historic details, namely the criteria for plant selection, the fact that *Indigofera* apparently was not (or, no longer) cultivated in Imerina in 1877, and that there existed dye makers – both foreign and indigenous – processing it on a large scale for sale to Tamatave, presumably for export.

11 Our final source is an article on textile fibers and dyes written in 1898 by a “ Native Commission ” (Commission indigène). Appointed by French colonial Governor Gallieni, this commission of Merina men was given the task of compiling knowledge on “ Native products and industries in Madagascar. ” It was presided over by Rasanjy, 15 honors. This so-called “ native ” Rasanjy was in fact a high-ranking member of Merina society and government. As a secretary to Prime Minister Rainilaiarivony he participated in numerous delicate diplomatic negotiations with European powers but increasingly aligned himself with the French after 1885. Accordingly, upon their conquest of the island, the French colonial administration appointed him acting governor of Imerina from 1896-1897. The findings of his Native Commission were published serially in *Notes, Reconnaissances et Explorations* in 1898, with the section on textiles appearing as the third installment. Written directly in French, the article regrettably does not provide local terms for colors or dye processes. It is the only of our Merina sources to describe making black dye from logwood (*bois de campêche*), and a purple dye from combining blue with red baths.

12 As women were historically the textile makers in Madagascar, should we be surprised that men placed such a great emphasis on dyeing and knew its details? No. As several works have recently emphasized (Campbell 1991, Larson 2000, Fee 2002), Imerina – including its capital city

13 Antananarivo – was the textile manufacturing hub of the island from at least the 18th century, with many if not most households devoted to weaving. Men traveled near and far to sell their wives’ products and were daily witnesses to many weaving activities, with boys no doubt assisting as needed. Moreover, British and French artisans active in the island from 1820 conscripted Merina men for their various textile-related efforts, which included a professional guild of indigo dyers (see below). Finally, world history has shown time and again that once a craft takes on large scale and commercial trappings, it attracts men to the practice.

14 For comparative purposes, this article also draws on select early Malagasy dye formulae recorded by European authors, namely those by Cauche (1651), Chapelier (1804), Ellis (1838), Nogue (1900) and Dubois (1938).

The recipes

15 Table 1 presents the different recipes offered by our four 19th century Merina sources for creating shades of red, yellow, black, orange, green, navy blue, and purple. The Ombiasy denotes the first six colors respectively as *mena, vony, mainty, lomotra, haboka*, and *angana*. The last three terms appear to have been reserved primarily – or solely – for denoting textiles dyes and dyed yarns.[6] The term *vony*, meanwhile, has since largely become archaic in Imerina, replaced by *mavo*.

Table 1 Dye sources described by 19th century Merina sources

Main plant ingredient	Color	Ombiasy	Tantara	Mpanolotsaina	Native Comm.
leaves of *engitra* or *aika* (*Indigofera* sp. Fabaceae)	Dark, blue, bluish, black	x		x	x
leaves of *marefolena* (*Phyllanthus bojerianus* Baillon ex Muell. Arg. Euphorbiaceae) combined with mud	Black, (from mud)	x	x		x
logwood (bois du Campêche) (*Haematoxylum campechianum* L. Fabaceae)	black				x
indigo combined with red [presumably *nato*]	purple				x
bark of *nato* (Sapotaceae, often *Labourdonnaisia madagascariensis* Pierre ex Baill.[7])	red	x	x		x
turmeric root (*tamotamo*) (*Curcuma longa* L. Zingiberaceae)	yellow	x			x
root of *moano* (?)	orange	x			x
mixture of *engitra* (*Indigofera* sp.) and *tamotamo* (*Curcuma longa* L	green	x	x		x
leaves of *engitra* or *aika* (*Indigofera* sp.)	blue	x			

16 Let us begin our discussion with the black dyes, for which three different plant sources are indicated.

Indigo

17 In both European and Malagasy sources, the lengthiest recipes are invariably accorded to indigo. And this for three reasons. First is the complexity of the dye bath, known in Malagasy as *lahasa*, or *soka* (var. *soke*). The indigo dye bath is a delicate chemical operation liable to failure, requiring the creation of successive soluble and insoluble states, and calibrated adjustments of alkaline or oxygen levels (Balfour 1998). Second is the dye's great cultural elaboration, entailing many rites and prohibitions in most areas of the world (ibid.), including Madagascar (Fee 2002). Finally, the interest in this dye stems from its great commercial value in both regional and international trade. A product of the tropics, *Indigofera* was one of the most valuable " spices " of the ancient world and a

primary focus of European colonial trade and cultivation in Africa and Asia (Balfour 1998). From the 17th century, Europeans planted it in Mauritius and Réunion and dreamed many dreams of growing it on a commercial scale in Madagascar. As early as 1651, Cauche (1910:156) provided a partial recipe for dying blue with cakes made from indigo plants (*engets*), which drew from his experiences in southern Madagascar.[8] It was the 1838 *History of Madagascar*, compiled by William Ellis (1838 I:327-329), which provided the first comprehensive description of indigo dyeing in the central highlands, detailing two discrete recipes.

18 Naturally, our authors (with the exception of the Native Commission) employ the highland Malagasy terms for indigo plants – *aika* and *engitra* – and do not identify the precise indigo-bearing plant referenced in their recipes. Nearly a dozen different plants correspond to *aika* and *engitra*, all from the Fabaceae family. Genera include both *Indigofera* and *Crotalaria*. Several species of the latter – *C. laevigata* Lam., *C. pallida* Aiton, *C. saltiana* Andr., *C. incana* L. and *C. retusa* L. – have been noted for their blue dyes (Boiteau 1999 I:212,259, Decary 1946:126). As concerns the genus *Indigofera*, over 42 known varieties have been observed in Madagascar – some endemic, some introduced (Du Puy et al. 2002). Those signaled by botanists as Malagasy dye sources include *I. anil* L., *I. tinctoria* L., *I. suffruticosa* Mill, *I. arrecta* Hochst. ex A. Rich, I., *I. hirsuta* L., *I. longiracemosa* Boivin ex Baill., *I. pedunculata* Hilsenberg & Bojer ex Baker, *I. stenosepala* Baker, *I. vohemarensis* Baill., and *Indigofera* sp. (Decary 1946, Boiteau 1999, Jansen et al. 2005 ; Du Puy et al. 2002). According to Du Puy et al. (2002:484), *I. arrecta*, native to Africa, is the most commonly occurring in the Malagasy central highlands, while Heckel (1910:19) holds that *aika* in Imerina refers primarily to *I. tinctoria*. The *Mpanolo-tsaina* author (1877:132) advises using the species of indigo plant (*aika*) with small fruits resembling *anatsonga,*[9]not the one with large leaves (*beravina*), the latter identified by Heckel as *I.pedunculata*.

19 The recipes of both the Commission and the *Mpanolo-tsaina* call for using " young " plants that are on the point of flowering. According to the Ombiasy, silk (*landy*) alone was dyed using the fermented bath; cotton and other fibers were dyed blue with fresh indigo leaves or dyed black with mud (see below). The Native Commission singles out one Merina group, the Zanak'antitra of Ambodirano[10], for producing the loveliest shades of deep blue.

20 Three general methods are used worldwide to process *Indigofera*. The first uses fresh leaves, the second harnesses fermentation, and the third extraction and precipitation (Balfour 1998). Our Merina sources provide descriptions of all three.

21 The Ombiasy provides a simple recipe using fresh leaves to impart a blue shade to leaf and bast fibers – raffia, spun bark (*hafotra*), thread-banana and hemp. Water is brought to a boil in a clean kettle and fresh (*lena*) indigo leaves are added to it. The leaves are gently pressed and when they discharge a blue liquid, the kettle contents are poured over the skeins which have been placed in a winnowing basket. One such session may suffice but, if not, the process is repeated.[11]

22 The indigo recipes involving rounds of fermentation are presented in Table 3. For comparative purposes we include in this same table the methods observed by Cauche and Ellis, mentioned above. In addition, as The Native Commission specifies that its recipe comes from the Betsileo, we present a Betsileo version collected by Father Dubois (1938) from Joseph Ralambo. The basic process entails pounding the leaves or plant, moistening and leaving them to ferment for several weeks or up to one year, whereupon the product is dried and formed into balls or cakes (*fatotra*). Separately, an alkali ash is made by

burning different plant ingredients, generally based on the stalk of the banana plant, creating a product known as *fondrana*.[12] Dubois' Betsileo method, however, features other sources. The indigo cakes and ash balls are next added to a kettle of water and heated over (or next to) a weak fire for one to six days, depending on the recipe. Several authors specify that the fire was fueled by dried cow manure. The dye is then tested on some item (banana fiber, cotton, or a stick) and, if judged successful, the skeins are then placed inside to soak – from one hour up to eight days. Alternatively they may be slowly dipped.

23 A few other observations on the fermentation recipes are in order. The Native Commission's Betsileo method calls for adding mud to the final mixture, the recipient then being plugged with a banana plant stump and heated with the skeins for eight days over a weak fire (the maximum time recorded). Both the Ombiasy and Ellis' second recipe entail a unique method for timing the first round of fermentation: the dyer waits for the appearance of caterpillars (*olitra*) in the recipient containing the fermenting indigo. Ellis (1838 I:328) specified that these caterpillars appeared three or more weeks after the *Indigofera* compost had been created and that they were allowed to spin reddish cocoons in the mixture.[13] Meanwhile, Ellis' first recipe, and that of Dubois, are curious for their lengthy period of fermentation: the composting leaves are stored in the home for a year before being formed into balls, an unusually long time according to indigo chemistry specialist Philip John (personal communication). The recipes all differ as to the composition of the plant lye ash. The Ombiasy requires only the base of the banana stalk, while Ellis' first recipe calls for adding liquid from *beravina*, another dye producing Papilionaceae.[14] Ellis' second formula requires two additional plants: 1.) the *vato-fosa,* a local term covering a number of species of the Amaranthaceae family (Boiteau 1999 IV:308-309), which " contain a quantity of very good potash " (Ellis 1838 I:327), and 2.) *tanantanampotsy* (probably *Jatropha curcas* L. (Euphorbiaceae) Boiteau 1999 III: 432-433). Dubois' Betsileo recipe, meanwhile, dispenses with banana stalk and employs instead *tsipotina* (unidentified by Boiteau)[15] and *ambiaty* (*Vernonia appendiculata* Less. Asteraceae Boiteau 1999 I:94); it fails to specify whether the leaves, roots or branches of these plants are used. In this Betsileo method, the ashes are burned twice, a method also practised by the Tandroy (Fee 2003). First the plant sources are reduced to ash; next, this ash is sandwiched between two layers of dried cow manure and the whole set on fire, the ash turning as hard as stone. Thereafter, ritual ingredients are added to the dye bath and supplications made to deceased Betsileo kings.

24 The Ombiasy hints at some of the Merina concepts and ritual that associated indigo dyeing with human gestation and death, recorded in many parts of the world (Balfour 1998), including among the Betsileo and Tandroy. Waiting for the sighting of worms (*olitra*) to determine if fermentation was complete may have conscious parallels with funerary rites, Malagasy peoples in some times and areas waiting for the sighting of maggots (*olitra*) as the measurement of time and propriety for interring the corpse (Fee 2002, Dubois 1938). For the five days of the dye's fermentation, the kettle was placed to the west of the hearth, enclosed by a small structure (probably of mats) and kept warm with a fire " like a person in postpartum seclusion " (*mifana*) according to the Ombiasy (Giambrone [1972]:109). Into the 20th century the Tandroy continued the practice of building a separate shelter for indigo dying although its effects were thought especially nefarious for pregnant women (Fee 2004:98).

25 The *Mpanolo-tsaina* meanwhile offers a radically different method for processing indigo, one intended not for local dyeing, but for long-distance commercial trade. Using a

process developed in India which spread to many other areas (Balfour 1998:109), it produces hard cakes that are amenable to shipping and lengthy storage but which are more difficult for dyers to manipulate. In his *Plantes et Animaux Utiles de Madagascar*, Decary (1946:126) reproduced a very similar recipe which he labeled " industrial preparation, " the end product used for bluing. The method may have been introduced to highlands Madagascar by Jean Laborde. His " industrial " center at Mantasoa included blue dye works and the manufacture of a necessary associated ingredient, lime, which was extracted from limestone imported from distant quarries.[16] Both of these activities were organized in professional guilds of corvée labor by Ranavalona I (Grandidier et al.1928:166 n3a). As of 1885, the indigo dyeing guild was called Amboalifoka and counted 21 members headed by one Rafaralahy, 3 honors (Nogue 1900: 422); it remained in operation when French colonial forces arrived in 1895 (Grandidier et al. 1928:166n3c). Nosy Be, a French colony from 1841, was another early center of commercial indigo cultivation.

26 In any event, the dyers interviewed by the *Mpanolo-tsaina* author were commercial producers, selling their wares at Tamatave, presumably for export.[17] The method required investment in specialized equipment: three barrels with holes bored in their bases, cloth to serve as stoppers for the holes and to strain the liquids, and a square mold/case with a fitted internal lid. The dye maker lined the bottom of the first barrel with indigo leaves taken from young plants, placed rocks on top as weights and added water to two hand spans (*zehy*) above the leaves, taking care not to disturb or bruise them. The mixture was left to stand overnight for fifteen hours (from 4pm to 7am), or until the leaves lost their tiny indentations. The dye maker then removed the cloth plugs from the barrel, straining the liquid through a cloth and collecting it in a dish. In the meantime he had prepared lime (*sokay*) with water in a second barrel, also fitted with holes. This mixture too was allowed to stand for fifteen hours, whereupon the cloth stoppers were removed and the liquid strained through a cloth into a dish. To test the readiness of the ingredients, a small portion of the indigo and lime liquids were mixed together at a ratio of 3:1 and stirred; the mixture should separate into a mass " as black as soot " and a green liquid " the color of ox urine. " If it did not separate, a bit more lime water was added. But, if the test was successful, the mixture was replicated in a large quantity, stirred, preferably with a wooden shovel (*sahiratsy*), and left overnight. The next morning, the stoppers were removed from the barrel and the liquid (" bad water, " *rano ratsy*) drained off, leaving a dark paste. To form bars and squeeze out any remaining liquid, this paste was transferred to a square mold with holes bored in the sides and lined with cloth. Boards were placed on top of the paste and weighted with rocks, causing them to sink by their own weight and press out the last liquid. The remaining mass was cut into bars and dried in the shade.

Table 2 Comparison of several early recipes for fermented indigo dye baths[18]

Source	Preparation of indigo plant	Preparation of second ingredient(s)	Dye bath procedures
Cauche 1651	-leaves pounded -formed into cakes weighing up to 3 pounds -dried in sun	none mentioned	-cakes pounded -boiled with water in earthen pot -removed from fire -cotton or silk skeins added
Ellis 1838 I	-plant chopped and pounded -left to ferment -every week for one year moistened with liquid made from steeped *beravina*	-banana root cut and dried and burned -moistened with *beravina* liquid and pounded -formed into cakes (*fondrana*) and dried before fire	-indigo leaves and banana-root ash boiled together for one day -solution placed in vessel and kept warm -skeins placed inside and left until color takes
Ellis 1838 II	-leaves pounded -put in basket to ferment - wait for caterpillars to appear and spin red cocoons (3-4 weeks) -dried in sun -product known as *fatobra* [sic]	-4 parts dried banana root, 1 part dried *vato-fosa*, and 1 part *tanantanampotsy* are burned -ashes formed into cakes 1 inch thick and 8 inches in diameter	-2 indigo cakes combined with 2 ash cakes in 6+ gallons of water -vessel heated for 6 days and nights -dye tested on wooden stick placed in mixture after 3 days -skeins dipped for 30 minutes, then dried for 3 to 6 days.
Ombiasy 1870	-leaves chopped and pounded -put in kettle to ferment -wait for the appearance of caterpillars; time not indicated -dried in sun -product known as *fatotra*	-base of stem of banana plant chopped and dried and burned -moistened with water -formed into cakes	-indigo cakes combined with water and crumbled banana trunk ash, brought to boil - vessel heated next to gentle fire for 5 days and nights -mat enclosure built around fire -dye tested on banana fiber to see if dye takes -skeins soaked over night
Commission Indigene 1898 (Betsileo)	-3 large pots placed near hearth -indigo plant which has not yet flowered, is pounded together with the ingredients listed in the column to the right	-banana base, young *vatofosa* and new leaves of *ambiaty* pounded with indigo at start of operation (see column to left)	-mixture of pounded plants put in a pot and left to ferment for 24 hours -substance at bottom of pot is removed and formed into balls which are put in dish or pot to dry for 4 days -water brought to boil in large pot and skeins added along with "mordant" and mud -pot is hermetically sealed with a banana stump and simmered over a fire of cow dung and leaves for 8 days -skeins taken out and dried -repeat second time if needed
Dubois 1928 (Betsileo)	-leaves ground and pounded -put in basket to dry for one month -stored in house for about one year -pounded and placed in kettle of water to soak for 15 days -formed into paste or dried in sun	-*ambiaty* and *tsipotina* dried in sun and then burned -ashes pounded then moistened with water -ashes placed between two layers of dried cow manure and burned	-indigo combined with water and ash and other ritual ingredients -vessel heated over gentle fire for one week, stirred from time to time -dye tested on cotton fiber to see if dye takes -skeins placed in mixture for unknown length of time

Black from mud and the *marefolena* plant

27 Dyers worldwide have discovered that an easier, if more corrosive, method for producing a durable black dye is through combining iron-rich mud with a plant tannin (Cardon

2007). In Madagascar, this jet black shade – " as black as the hide of black zebu " according to the Ombiasy (Giambrone [1972]:109) – is differentiated from the bluish-black of the indigo dye bath *lahasa*. The basic recipe entails boiling the *marefolena* plant (*Phyllanthus bojerianus* Baillon ex Muell. Arg.) with water, immersing the skeins and then rubbing them with special mud known as " mud black " (*maintim-potaka*), carefully chosen from fields or ponds. Modern scientists know such muds to be rich in iron (Cardon 2007). Of the authors, only the Native Commission indicates the part of the *marefolena* plant which is used – its leaves. Nogue (1900) and Malzac (1888) confirm the same. The Ombiasy's recipe includes only *marefolena* and mud while all the others call for one or more additional ingredients (see table 3).

Table 3 Recipes for marefolena and mud (maintim-potaka)

Source	Ingredients	Steps
Ombiasy (1870)	*marefolena* and mud	-*marefolena* and water brought to boil then plant remains removed -skeins placed inside and mixture allowed to cool -skeins individually rubbed with mud and left to "ripen" over night -the next day, skeins rinsed and dried -process repeated 2 or 3 times as necessary
Tantara ny Andriana (1878)	*marefolena*, mud, *vonivony* (?) and *tamotamo* (*Curcuma longa* L.)	not indicated
Native Commission (1898)	*marefolena*, mud, and *jambosa* (*Eugenia jambosa* Crantz Myrtaceae)	-leaves of *marefolena* are boiled with *jambosa* -skeins are placed in the mixture and covered with mud -left for 2 days, then rinsed and dried
Nogue (1900)	*marefolena*, mud, leaves of *zamborozano* (probably *Eugenia jambosa*) and *lampiadianeketa* (?)	-leaves pounded and 63 piaster weight of leaves added to 6 liters of water -skeins of silk or raffia placed inside and heated until half of liquid has boiled off -skeins and leaves removed and skeins dried -skeins taken to rice fields and dunked in mud -skeins returned to kettle of dye liquid and heated, being stirred often then left overnight to soak -skeins rinsed next morning and operation repeated if necessary

28 According to the Ombiasy, the *marefolena*-based dye was reserved for use on yarns made of thread-banana, bast (*hafotra*), cotton and raffia.[19] Presumably these fibers did not absorb, or could not withstand, the *lahasa* fermented indigo dye bath described above.

Black from *bois de campêche* (logwood)

29 The Native Commission is alone among our authors to record a recipe for a highlands Malagasy black dye obtained from *bois de campêche* or logwood (*Haematoxylum campechianum* L.), a species native to Mexico. Following Spanish colonization of the Americas, the cultivation of logwood spread around the world, including to the island of Mauritius by 1767 (Cardon 2007:264).

30 According to the Commission (1898:375): " One boils logwood in water, together with *marefolena* and *jambosa*, then one adds the skeins and lets them soak for 24 hours. This method is very similar to that for obtaining a black dye from mud. "

31 This trend of using introduced species – *Curcuma*, logwood and certain species of *Indigofera* – has continued to the present date, with many modern highland weavers employing tea leaves, onion, etc. in their current revival of natural dyeing.

Red dye from *nato*

32 Madagascar's most distinctive textile color is a rich reddish brown. In many areas, it is obtained from the tree bark of *nato*, an indigenous term which, in fact, corresponds to several species of Sapotaceae (Boiteau 1999 III: 63-72). We are fortunate to have a very early highlands recipe for this dye source, recorded by French botanist Armand Chapelier in 1804 (Fontoynont 1912:312). It is highly regrettable that French officials ignored Chapelier's repeated requests for funding to undertake a study in Imerina on indigenous silkworm rearing and dyeing. Nevertheless, Chapelier succeeded in obtaining a *nato* recipe from Merina residents he met at his base on the east coast.. His recipe and those of our Merina sources are summarized in Table 2. All concur that the *nato* bark was tied into small bundles and brought to a boil together with additional ingredients.

33 The Native Commission and *Tantara* call for four or more plant mordants, overlapping on two ingredients (*dingadingana* and *vatofosa*) and differing on the others. Meanwhile, the Ombiasy's formula appears much simpler, employing only *bongo* as its mordant.[20] This same recipe was being employed 100 years later in the highlands, as recorded by Vernier (1964) in the northern Betsileo region of Andina. Several *bongo* varieties have been associated with highlands dyeing, as either dye or mordant, and sometimes as both at once. These include the *bongolahy* (" male bongo, " *Danais verticillata* Baker Rubiaceae) which produced an orange color " very esteemed as a textile dye " (Boiteau 1999 I:227), the *bongovavy* (" female *bongo*, " *Dionycha bojerii* Naudin) used by the Betsileo as a mordant (ibid.), and *bongonomby* (" cattle *bongo*, " *Danais fragrans* (Comm. ex Lam.) Pers.), a vine whose root served the Betsileo as a red dye (ibid.:228). Recent studies by D. Cardon (2007:150) have revealed the chemical properties that render the last, *Danais fragrans*, such an effective dye source: " As well as containing red anthraquinone colorants in their roots, these plants also accumulate aluminium in their leaves, thus presenting interesting natural combinations of mordant and red colorants all in one package. " Chapelier's *vahe mantci,* " stinking vine, " is also apparently a Rubiaceae.[21] His recipe calls for rubbing the skeins with ash, a custom still practiced today (*ibid*.).

Table 4 Early recipes for *nato* dye

Source	Mordant	Steps
Chapelier 1804	*vahe mantci* [*vahe mantsy*], probably *Paederia thouarsiana* H. Bu. Rubiaceae	-skeins rubbed with ash -external bark of *nato* tied into small bundles -*nato* bundles placed in kettle with water and brought to boil -kettle removed from fire and skeins soaked in mixture for 24 hours -process repeated up to 5 times -for final soaking, the ash of *vahe mantci* is mixed with several ounces of final *nato* dye bath
Ombiasy 1870	*bongo*, probably *Danais fragrans*	-*nato* bark is broken into bits, dried and tied in small bundles -*nato* bundles placed in kettle with water and *bongo* (part of plant not specified) and brought to boil -process repeated up to 5 times -the skeins are placed in the mixture and left overnight; removed and dried in the daytime; this step repeated as needed to produce a dark red shade
Tantara ny Andriana 1878	*vatofosa*, a general term for potassium salts obtained from plant ash, usually *Achyranthes aspera* L. Amaranthaceae (Boiteau 1999 IV:308) *anam-patsa*, *Amaranthus spinosus* L. (Boiteau 1999 I:122) *dingadingana*, *Psiadia altissima* (DC.) Drake Asteraceae (Boiteau 1999 I: 244) *taimborontsiloza*, *Chenopodium ambrosioides* L., Chenopodiaceae (Boiteau 1999 IV:392)	not indicated
Native Comm. 1898	*felambarika*[22], *Dionycha bojeri* Naudin, Melastomataceae (Boiteau 1999 II:352) *vatofosa* (see above) banana plant stalk cactus young leaves of *dingadingana* (see above[23])	-mordant ingredients are burned and ashes mixed with water; this is strained and poured over skeins -*nato* bark is cut into bits and tied in small bundles -kettle is filled with water and *nato* bundles along with some powdered *nato* bark -for eight days in morning and evening, mixture is brought to a boil -*nato* is removed and skeins placed in kettle and mixture heated -when dye has taken, skeins removed and dried -often repeated so as to thoroughly penetrate yarn

Yellow

34 Both the Ombiasy and the Native Commission provide recipes for a yellow dye made from turmeric, *tamotamo* (*Curcuma longa* L.). A cultivar originally from India, *Curcuma* spread throughout the world from an early date as a medicine, food spice and a direct dye source which requires no mordant. It reached Africa by 800 CE and became the universally most popular dye for yellow (Cardon 2007:320). The recipe of the Native Commission (1898:375) notes only that " one grates turmeric on a flat rock and adds water. " The Ombiasy

elaborates that the mixture was strained and brought to a gentle boil with the skeins, the process often repeated several times; a concentrated liquid was needed to produce a good shade. Reflecting the importance of this dye source, the term *tomamotamo* – probably a derivative of the dye name – emerged in the highlands to denote a yellow-orange color in general (Abinal and Malzac1888).

Orange

35 The Ombiasy and the " Native Commission " likewise both describe the extraction of the color orange (*haboka*) from the root of the *moàna*.[22] Thus far, scholars have been unable to identify this plant – with variant spellings *moàno* and *moàny*. Both Malzac[23] and Boiteau merely indicate its role as a dye, the latter adding that a *hazomoana* is known amongst the Betsimisaraka for treating wounds and is also used as a yellow colorant (Boiteau 1999 II:11). The Commission (1898:375) provides a useful hint that the *moana* is " a large forest tree. " The Ombiasy, however, gives the more detailed recipe (see below): after pounding, the *moana* root was boiled, strained, boiled a second time and the skeins placed inside. Apparently it required no mordant.

Blue

36 According to the Ombiasy, a navy blue shade (*angana*) was made by soaking skeins in the indigo dye bath, but not allowing them to come into contact with the residue at the bottom of the kettle (see below).

Green

37 18th century sources on Merina weaving mention only the existence of red, black/blue and yellow yarns (Mayeur 1912:153). The *Tantara,* Ombiasy and Native Commission all indicate that green (*lomotra*) was also a staple by the 1870s. In most areas of the world, no single plant source can produce a green dye; rather, the shade must be obtained by combining blue with yellow (Balfour 1998:5). Our authors show this to have been the method of highlands Imerina. Once again, it is the Ombiasy who provides the most complete recipe, revealing that the process was in fact laborious. Turmeric (*tamotamo*) and lemon juice (*voasary*) were added to the remnants of indigo dye, and the mixture brought to a boil. The skeins had then to be lowered into the dye bath but had to be prevented from coming into direct contact with the solid dye matter at the bottom of the kettle. To accomplish this, the skeins were tied with strings to reeds placed across the top of the kettle. The whole process was then repeated two or three times. The Native Commission offers an alternative recipe: skeins dyed blue by the Zanak'antitra of Ambodirano (see above) were treated with lemon juice.

Purple

38 The Native Commission provides the lone recipe for purple, a color which appears to be a late comer to highland handweaving palette and, like green, is not part of the cosmological color scheme, which includes only white, red, yellow and black. The Commission records that indigo cakes were dissolved in water and poured over the

skeins, followed by a similar rinse of " red. " It does not indicate the source of this red dye, which may have been *nato*, or a chemical substance. The skeins were rinsed with nitric acid (*eau-forte*) and put out to dry.

The Ombiasy's dye recipes: a summary

39 In this article we have stressed the importance of the Ombiasy's dye recipes. Although often brief, they represent the most complete historic recipes for several highlands dyes sources.

40 At the end of this work we provide a close translation of the Ombiasy's text. Below, we offer a summary of the recipes as an aid to the reader. As Dez (1962:42) has lamented, the original narrative can make for difficult reading. Resembling oral delivery or *sorabe*, it lacks punctuation and is composed of many short clauses joined with conjunctions (*dia, ary*). The text is prone to repetitions and jumping between topics. For instance, having described the process of dyeing yarn black, the author begins describing the process for light blue, only to revisit techniques for fixing the color black and the difference between black shades.

Blue-black from an indigo dye bath for silk yarn:

41 To begin the process, the dyer chops fresh (*lena*) leaves of indigo, pounds them in a mortar and places them in a kettle. She leaves the kettle until the contents ferment and caterpillars/grubs (*olitra*) appear inside. Next she places the contents on a mat to dry. She then returns them to the kettle, adds some freshly chopped indigo leaves and brings the mixture to a boil until it produces a bluish liquid. This liquid is poured over other indigo cakes and mixed together, then left for three days in the kettle. Next the contents are dried on mats.

42 In the meantime, the dyer prepares the second ingredient: balls of banana-stalk ash (*fondrana*). She takes pieces of the base of the stalk of the banana plant, breaks them in bits, lays them out to dry, then sets them on fire. When the ashes are cool she adds a little water and shapes the ash into balls.

43 She places the indigo cakes in a kettle filled with water, crumbles the banana-stalk ash into the mix and brings it to a boil. Next a fire is kept burning near the kettle for five days in a specially prepared manner: a small hole is dug to the west of the central hearth and filled with dried cattle chips which are set on fire. The dye kettle is placed near the fire and an enclosure (presumably of mats) built around it to contain the heat. To see if the dye is ready, the dyer tests it first on a bit of thread-banana fiber, placing it in the mix and leaving it overnight. If she finds the dye has penetrated the fiber, she adds the silk skeins to the kettle in the evening, removes them in the morning, rinses and hangs them to dry. Silk dyed in this fashion was known as *soka*.

Black from the *marefolena* plant and mud:

44 *Marefolena* is heated to a boil in a kettle of water and then the plant remains are removed. The skeins are placed in the bath and the mixture left to cool. Next mud is fetched from the fields and each of the skeins rubbed with a large quantity. The yarn is then put out to

dry and left overnight to " ripen " (*miotrika*). The next day they are rinsed and again put out to dry. To obtain a very deep black, the whole process was repeated two time or three times.

Blue (*angana*) from indigo:

45 A lighter blue is had by dyeing skeins in the indigo and banana-stalk ash mixture, but the skeins are not allowed to come into contact with the solid matter at the base of the kettle. To prevent contact, the skeins are folded up and as described above.

Green (*lomotra*) from turmeric and indigo:

46 A green dye is had by adding turmeric (*tamotamo*) mixed with lemon juice (*voasary*) to the light blue dye residue described above and bringing the mixture to a boil. The skeins are then placed in the dye bath but, here again, must be prevented from coming into direct contact with the indigo and banana-stalk ash at the bottom of the kettle and are suspended from sticks placed across the top of the kettle. This process is repeated two or three times to get a nice shade of green.

Yellow (*vony*) from turmeric (*tamotamo*):

47 The dyer " works " (presumably presses or scrapes) turmeric root into a thick liquid and then strains it, discarding the solid matter and gently heating the remaining liquid. She places the skeins in the kettle and leaves them overnight. She may need to repeat the process two or three times until she has obtained the desired shade.

Orange (*haboka*) from *moano* root:

48 The root of the *moano* is pounded in a mortar then brought to a boil. When about a quarter of the liquid has boiled away, the solid matter is strained off and removed and the skeins placed in the remaining liquid. The mixture is brought to a gentle boil. If this initial treatment does not produce the desired color, then more root is added and the process repeated.

Red (*mena*) from *nato* bark:

49 The dyer breaks *nato* bark into small pieces, puts them out to dry, then ties them into small bundles. These are added to a kettle filled with water along with a second ingredient: *bongo* " a plant that grows in the forest. " The Ombiasy does not specify a particular variety of *bongo*, there being several associated with red dyes (see above).

50 The mixture is cooked from two to five times until it has produced a dark red liquid. Thereupon, the skeins are submerged, left overnight, wrung out and dried, the process repeated until the desired shade obtained.

Blue (*angana*) dye for bast (hemp, *hafotra*) and leaf (raffia, thread-banana) fibers:

51 See description partie Indigo.

“ Things for making *lamba* ”

52 At seventeen pages, the chapter devoted by the Ombiasy to weaving arts is one of the longest in his manuscript. It appears as Chapter 16 in the published version, tucked away in the middle of Book 10 and simply entitled *Ny zavatra fanao lamba*, “ Things from which *lamba* [textiles] are made. ” The first four pages are devoted to dye techniques, describing the steps for producing the colors blue, twos “ shades ” of black, green, orange, yellow, and red.

53 Below we present these four pages in Malagasy and alongside them place our close translation in English. To aid reading and comprehension, we have created paragraphs out of the original text composed of run-on sentences. While the Ombiasy used only the passive voice to describe the processes, for clarity’s sake we occasionally make clauses in the active voice by using the second person pronoun “ you ” or add an agent, “ the dyer. ”

54 Page numbers indicated by () designate the pagination of Giambrone’s 1972 published version while page numbers marked by [] indicate those of the original manuscript stored at the Académie Malgache. In our presentation of the text, we follow the usual conventions. The orthographic differences between the three manuscripts are commented in footnotes: the abbreviation MN refers to the manuscript version held at the Muséum National d’Histoire Naturelle in Paris and AM to that held at the Académie Malgache. Mss stands for both manuscripts, while corr. Indicates that the authors have opted for an alternative spelling found in none of the manuscripts but that they deem correct.

16. *Ny zavatra fanao lamba*.	16. Things for making lamba (109 [262])
Ny landy, ny landihiazo, ny sarikia,[24] *ny rongony, ny raofia. Ny hafotra misy fanao lamba hiany*.	Silk, cotton, thread-banana, hemp, raffia. Even some kinds of hafotra [bast fiber] can be used to make lamba [textiles].
Ny fanaovana ny landy, voalohany, ahandroina, nony masaka, dia folesina,nony voa foly, dia aira aminy fantaka, atao efa-dia, na telo dia, nony voa aira, dia maintisina[25] *ny hatao mainty. Ary ny fanamaintisana iray loha, maintisina aminy fatotra sy ny fondrana, vody akondro*,	The way to do silk, first it is heated, and when it is cooked, it is spun, and after it is spun, it is wound onto poles [i.e. made into skeins], in lengths of four feet[26], or three feet, and after the skeins are made, then you dye black the part destined to be black. As to how skeins[27] are made black, they are made black with cakes of indigo and fondrana, the base of the banana plant,

ary ny fanao ny fatotra, alaina ny aikia atao betsaka, dia taptapahina tetehina madinikia, dia totoina tsara nony voa tetikia, nony voa toto, dia tehirizina aminy vilany lehibe, nony efa miteraka olitra ao ambilany izy, dia ahahy aminy tsihy ho maina tsara, nony maina, dia tehirizina aminy vilany nitoerany teo, dia alaina [28] *indray ny aikia lena, dia tanehina mafana tsara ny rano, dia atao eo ny aikia lena*[29] *[263] dia miteraka ranomangamanga, nony efa miteraka rano manga ny aikia, dia atondraka ao aminy fatotra ny ranony, dia haroina tsara ny fatotra, dia avela hilona hateloana nony efa milona hateloana, dia ahahy aminy tsihy ho maina tsara, nony efa maina dia tehirizina aminy harona, fa tsy atao ao ambilany intsony,*	and to make indigo cakes, a large quantity of indigo plant [leaves] are gathered, and cut up very small, into tiny pieces, then pounded in the mortar, and after they have been cut and pounded, then they are conserved in a large kettle, and when worms (olitra) appear (" are born ") in the kettle, then [the contents] are placed on mats to dry completely, and when dry they are returned to the same kettle where they were, then more fresh indigo leaves are fetched, and water is heated until it is nicely warm and these fresh leaves are placed inside, [263] and then it produces (" gives birth to ") a bluish liquid, and when the indigo has produced blue liquid, this liquid is poured over indigo cakes, and the cakes are mixed well, and then it is left to soak/ferment for three days, and after it has been left to soak for three days, it is placed on mats to dry well, and after it is dried it is conserved in a basket, for it is not put back in the kettle,
ary ny fondrana, dia mba efa voa vaky vaky fony vao nanao ny fatotra, dia efa nahahy koa homaina, ary nony efa vita ny fatotra, dia odorana ny fondrana, nony efa may tsara, dia lemana kely ho lena, atao azo volavolaina[30] *, dia volavolaina, nony voavolavola, dia ahahy homaina, nony maina tsara ny fondrana, dia atao ao aminy vilany lehibe ny fatotra, dia asiana rano betsaka, dia vakivakina ny volavolam-pondrana, dia aharo ao aminy fatotra, dia haroharoina tsara, dia tanehina atao mangotrakotra tsara,*	as for the banana stalk base, it has been broken up into pieces, at the moment when the indigo cakes were being prepared, and the pieces are spread out to dry, and once the indigo cakes have been prepared, then the banana stalk base is set on fire, and once it is well burnt, it [the ash] is moistened to the point where it can be shaped into balls, and it is shaped into balls, and once it has been formed thus, the balls are dried, and when they are dry, then the indigo cakes are placed in the kettle, and a lot of water is added, and the balls of banana stem ash are broken up, and they are mixed with the indigo cakes, and it is all mixed together well, then the water is heated until it boils,

dia ajanona, dia atao eo andrefampatana, dia hadina eo andrefany fatana, anelanelany fatana sy ny vilany misy ny lahasa, dia asiana zezikia maina, hasiana afo atao tsy maty eo aminy lavaka mandrapahavita ny lahasa[31] *, dia fefena kely ny vilanin-dahasa, atao tahaky ny olona mifana, atao mafana tsara, dia saronana tsara ny lahasa, dia haroharoina tsara ny ranon-dahasa ao ambilany, ary nony afaka hadimiana dia izahana fandrao efa antitra ny ranon-dahasa efa mandaitra, dia alaina ny sarikia, dia tadina, dia atsoboka ao aminy lahasa indray alina, nony ampitso maraina, dia izahana, ka nony mandaitra, efa mainty ilay sarikia nizahana nylahasa, dia atsoboka ny foly, ary raha tsy mbola mandaitra, dia [264] avela aloha, fa rehefa mandaitra vao atsoboka ny foly, ary ny fanao ny foly ao aminy lahasa, atsoboka harivariva ka nony maraina, dia esorina, dia fiazana tsaratsara*[32] *, dia ahahy ho maina. Dia toy izany no fanao azy, mandrapahamainty ny tsara,*	then the heating is stopped and [the kettle] is placed to the west of the hearth, then a small hole is dug to the west of the hearth, between the hearth and the kettle with the dye bath, and then dried dung is placed in the hole and lit on fire to burn slowly until the black dye bath is finished, and a small enclosure is built around the kettle dye bath, as for a person in postpartum seclusion, and [the space] is kept hot, and the kettle is covered tightly, and the dye bath liquid in the kettle is stirred well, and after five days, one examines it to see if the color of the black dye bath has become dark and penetrates, [and to test this] one fetches thread-banana fiber and plies it into a cord, and one submerges it into the dye bath overnight, and the next morning, you examine it, and if it has penetrated [the fiber], if the thread-banana fiber is black, the purpose for inspecting the dye bath, one dunks the thread into the kettle, but if the dye does not penetrate [the banana fiber] [264] then you wait a bit, but if it has penetrated, then you place the yarn in the dye, and as to how the yarn is dyed in the dye bath, it is submerged in early evening, and in the morning it is taken out, and it is wrung well, then it is set out to dry. And that is how it is done, until it has become a deep black,
ary ny hatao lomotra sy angana, rehefa mangamanga dia avela, ary ny foly tsy atao mihiatra aminy ventiny ny fatotra sy ny fondrana, fa aforitra atao fohifohy, ka asiana kofehy eo antatenany, ka asiana tapa-jozoro eo aminy vavany vilany, ka ahantona aminy zozoro ny foly[33] *, ka atao tsy mihatra aminy ventiny fatotra ny foly, fa simba raha mihiatra aminy fatotra ny foly,*	concerning the making of green and blue dyes, once the liquid is a light blue it is left, and the yarns are placed in it but are not allowed to touch the solid parts of the indigo cakes and banana-ash balls, but rather [the yarns] are folded and tied with a small string and lengths of reed are placed across the mouth of the kettle and the yarn is suspended from the reeds, so that it does not come in contact with the solid matter of the indigo cake, because direct contact with the indigo cake will damage it,

ary nony efa mainty tsara ny foly, dia ajanona, dia soka no anarany iny foly natao mainly lahasa iny. Izao no fanao ny lahasa fanamaintisana ny landy iray loha. Ary ny fanamaintisana iray loha, ny fotaka mainty, raha ho maintisina ny foly, alaina ny marefo lena zavatra maniry, tanehina ka nony mangotraka tsara, dia esorina ny ventiny, dia atosoboka ao aminy rano ny marefolena ny foly ho maintisina, nony efa mangatsiaka dia esorina, dia alaina ny fotaka mainty eny antsaha, dia hosorana fotaka ny foly atao bestsaka ny fotaka, dia ahahy ho maina, dia avela hiotrikia indray alina, nony ampitso, dia sasana, dia ahahy, ary dia atao toy izao mandrapahamainty ny, na hatao indroa na intelo.	and when the yarn has taken a nice black shade, the process is stopped, and soka is the name of the yarn that has been [dyed] with a black dye bath. That is how a black dye bath is done to make silk skeins black. And to make skeins black, black mud [is used], if one wants to dye yarn black, you gather marefolena, a type of plant, and heat it to a rolling boil, then the solid matter is removed, and the yarn to be dyed is dunked into the marefolena liquid, and when it is cold, the skeins are removed and black mud is fetched from the fields, then the yarn is rubbed with a large quantity of mud, then it is put out to dry. And it is left to ripen/ferment (miotrika) over night, and then the next day, it is washed and put it out to dry, and this is repeated until it is really deep black, perhaps two or three times.
Izao no fanamaintisana sy landy. Ary samy hafa ny fahamainty ny atao aminy lahasa, sy ny maintim-potaka, ny mainty ny lahasa manga antitra ary ny maintimpotaka[34] *mainty dia mainty tahaky ny volona'omby mainty, ny olona sasany tia ny soka aminy lahasa, ary ny sasany tia ny [265] maintim-potaka,*	And that is how you dye silk black. And two different shades of black are produced by the two processes of lahasa and mud-black. The black made through lahasa is a deep blue while the black of mud is jet black, as black as the hide of black zebu. Some people like the black dye (soka) made through lahasa, while others prefer [265] the black from mud,
ary ny hatao angana, dia ilay navela fony vao mangamanga, tsy mbola mainty loatra,	and to make navy blue (angana), [it is done from the liquid+ that is still just a light blue, that isn't yet very black,
ary ny lomotra koa, dia ilay tahaky ny angana no asiana tamotamo sy voasary, ny fanao ny lomotra, asaina aminy ranom-boasary[35] *ny tamotamo, dia tanehina kely atao mafanafana, dia atao ao ny foly, dia tonga lomotra izy, dia atao toy izao ny lomotra, na hoindroa na intelo mandrapaha maitso ny tsara, ary rehefa tsara aminy voalohany dia avela. Izao ny fana-lomotra*	and green too is done as with the light blue, [but] turmeric and lemon juice[36] are added, to make green, you blend turmeric with lemon juice, and you heat it a little, and then you put the yarn in and it turns green, and that is how you make green, and you do this two or three times until it takes a nice green shade, and if it is already green after the first time, then you can stop there. That is how you make green.
Ary ny fanao ny vony, ny foly fotsy no asiana tamotamo, ary ny fanao ny tamotamo asaina ny tamotamo, ka tantavanina tsara esorina ny ventiny, (110) dia afanafaina kely ny ranontamotamo, dia atao ao ny foly, dia avela hilona indray alina, ary raha tsy mbola tsara, dia asiana indray, na indroa na intelo mandrapahatsara ny, ary ny rano ny tamotamo anavana ny lomotra sy ny vony, atao marihitra tsara handaitra tsara,	And to make yellow, turmeric is added to the white yarn, and to use turmeric, it is worked (asaina) and strained well and then the solid material is removed (110) and then the turmeric liquid is gently heated, and the yarn is placed inside and left overnight, and if the dye hasn't taken well, the process is repeated again, two or three times until it is the right shade. And the turmeric liquid used for making green and yellow must be thick so it will penetrate well,

Ary ny fanavana ny landy mena, ny hody nato, ary ny fanao azy alaina ny hodinato vakivakina madinikia, dia aha ho maina tsara, dia fehipehezina madinikia, dia tanehina asiana rano betsaka aminy vilany lehibe dia asiana bongo koa ao aminy nato, ny bongo zavatra maniry any anala, dia tanehina isan-kariva ny nato, nonyindroa no tanehina, dia izahana ny ronato na efa antitra na tsy mbola antitra rehefa antitra aminy indroa, dia atsoboka ny foly, ary raha tsy mbola antitra dia tanehina hiany, misy tonga indimy no tanehina voantitra [37] *ny ronato, nony antitra dia atsoboka ny foly, dia isan-kariva no atsoka ny foly, nony ampitso maraina, dia fiazana ahahy, dia atao toy izao no fanao azy, mandrapahamenany tsara.*	And to make red silk, the bark of the nato tree is used. And to do this nato bark is fetched and broken up into tiny pieces, then put out to dry throroughly, then these are tied into small bundles and heated in a large quantity of water in a big kettle and then bongo is added to the mixture, bongo is a plant that grows in the forest, and every evening the nato mixture is heated, and when it has been cooked twice, the nato liquid is inspected to see whether or not the shade is dark red yet, and if it is red after two times, then the thread is placed in the kettle, but if the red isn't dark yet, it is heated again. Sometimes it must be done five times before the liquid is really dark, and when it is dark, the yarn is placed in the kettle, and each evening the yarn is placed in the mixture, and in the morning the skeins are wrung and put out to dry, and that is repeated until the correct shade of red is obtained.
[266] *Izao no fanao ny foly mena. Ny fanao ny haboka, alaina ny fakany moano, fakan-javatra menamena, dia totoina, ka tanehina, atao mangotrakotraka tsara, tanehina ela ela hiany atao mihena, tokony ho very fahefatra ny rano, dia tantavanina tsara esorina ny ventiny, dia atsoboka aminy iny mafana iny ny foly, dia tanehina atao mangotraka*[38] *kely indray, nony tsara dia avela, ary raha tsy mbola tsara, dia asiana indray manao indray. Dia vita. Izao no fanao ny haboka*.[...]	[266] That is how red yarn is made. To make the color orange (haboka), you take the root of the moano, the root of a reddish thing, and you pound it by mortar, then you heat it, and when it is boiling well, you let it keep cooking a while longer, until about one quarter of the water boils away, then you filter it and remove the solid matter, then you put in the yarn when it is hot and you continue to heat it until it boils a little, and if it's ready then you can stop there, but if it [the color] is not right yet, then you add more and do it again. Then it is ready. That is how you make orange. [...]
(112) [274] *Ary ny fanao angana, dia ny landihiazo sy ny rongony sy ny sarikia sy ny raofia, sy ny hafotra. Alaina ny aikia lena, dia tanehina atao mangotraka tsara ny rano aminy vilany madio no avanana azy (113), nony efa mangotraka tsara ny rano, dia atao ao ny aikia, dia tsindritsindriana, nony miteraka manga, dia atao eo aminy sahafa ny zavatra atao angana, dia tondrahana ny rano naikia, raha manga tsara aminy indray manao dia vita, ary raha tsy mbola manga, dia atao indroa, no asiana ranon'aikia*	(112) [274] And to make navy blue (angana), well [it can be done for] cotton, hemp, thread-banana, raffia, or hafotra [tree bast fiber]. Fresh indigo [leaves] are fetched and water is brought to a rolling boil in a clean kettle (113), and when the water is boiling, the indigo leaves are added and pressed gently and when they produce a blue color, the stuffs to be dyed blue are placed in a winnowing basket and the indigo-liquid is poured over them, and if the first round produces a good blue color, then it is finished, but if it isn't yet blue, a second round is done, adding more indigo-liquid,

ary ny lomotra dia ny angana [275] hiany no asiana tamotamo, ary ny vony dia ny fotsy no asiana tamotamo, ary ny mena dia natoina tahaky ny landy, ary ny mainty, dia maintim-potaka, izao no fanovàna volo ireo zavatra ireo.	and for [making] green [275] turmeric is simply added to indigo, and for [making] yellow, turmeric is applied to white [thread], and for red a similar procedure is followed as for dyeing silk, and black is made from mud, that is how you change the colors of these things

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NOTES

1. Alfred Grandidier (1928:167n3) singles out the year 1867 as the time from which Malagasy began employing imported bright synthetic dyes to color silk; previous to this, he asserts, predyed [mulberry] silk was imported from Europe.

2. Grandidier drew from the —Ombiasy's manuscript‖ for his own writings on Madagascar, including those concerning textile dyes (Grandidier et al. 1928:167-168), but often did not cite the work.

3. The Paris Muséum copy was consulted by the authors for the present article.

4. We thank Noël J. Gueunier for directing our attention to the *Mpanolo-tsaina* article.

5. « '*Samy maka ho azy*' [Each man for himself], » observes the author of « Ny Aika » (1877:132), « is a proverb suitable for pigs and other animals, but not for Christians. »

6. Freeman, Johns et al. translate *angana* as « blue silk or thread, » as does Malzac. Freeman, Johns et al. define *haboka* as « orange colour silk » and Webber *lamba háboka* or *káboka* as « yellow cloth. » Finally, the former defines *lomotra* as a vegetal concretion while Malzac's third definition gives « dark green dye. »

7. Formerly Imbricaria madagascariensis.

8. The 17th century recipe of Flacourt (1661:133) for indigo (*bhangets*) – which entails barrels, olive oil and whisks – appears not to describe local Malagasy methods, but rather those of India or French colonists residing in Fort Dauphin or elsewhere. Copland's (1822) description of dyeing with indigo – *bhangets* – is obviously taken from Flacourt, while that of Oliver (1886) is taken from Ellis (1838).

9. *Anantsonga*, —noms de choux d'origine asiatique‖ according to Boiteau (1999 I :134).

10. Ambodirano was one of the 6 historic districts (*toko*) of Imerina, located southwest of Antananarivo. Zanak'antitra refers to original landowning groups.

11. See also Chapelier's 1799 formula for dyeing raffia with fresh indigo leaves on the east coast (Colin 1811:82-83).

12. The Merina proverb *Lany fatotra ama-kondrana*, « all out of indigo cakes and banana stemash, » memorializes the interdependence of these two dye ingredients. It is employed as a warning against unwise spending or depleting one's savings. However, its primary terms *fatotra* and *fondrana* are no longer understood today (Narivelo Rajaonarimanana personal communication). Indeed, commentators on Malagasy proverbs from the 19th century onwards,

with the exception of the *Firaketana* (1965 :172), have failed to understand its dye referents (Noël J. Gueunier, personal communication).

13. Jenny Balfour-Paul, a specialist in indigo dyeing around the world, and Philip John, a plant biochemist who has researched traditional indigo production, cannot account for the practice involving caterpillars, nor recall its existence elsewhere in the world. Balfour-Paul suspects it may be linked to chemical or odor changes brought about by fermentation.

14. « Nom donné à plusieurs Papilionacées tinctoriales, par opposition à l'indigotier proprement dit dont les folioles sont plus petites. Ce sont *Crotalaria incana* L., *C. saltiana* Andr. et *Indigofera pedunculata* Hilsenberg et Bojer » (Boiteau 1999 I :212).

15. According to Noël Gueunier (personal communication), *tsipotina* could be a variant of *tsipoteke, tsipotika*, a common plant name. In the southwest of the island, it corresponds to *Bidens sp.*, Astéracées. Elsewhere, the term *tsipòteke* corresponds to *votofosa* (see table 4).

16. Laborde's outfit also produced dye from the introduced roucou (Grandidier et al. 1928:165n2a).

17. « Many Europeans [*vazaha*] and locals [*tompontany*] have become rich and happy because they have planted and harvested *Indigofera*. It fetches a high price when it is well made and sometimes can be sold for *ariary* telo a pound. It is easy to transport, for one person can carry 70 to 80 pounds when he goes to Tamatave to sell to buyers » (Anonymous 1877 :131).

18. For other early *Indigofera* dye recipes, see Nogue 1900 insert

19. The Tandroy, however, use the indigo dye bath for cotton (Fee 2003).

20. The dictionary entry of Freeman, Johns et al. for *bongo* indicates it was especially used for dyeing raffia.

21. Boiteau 1999 interprets Chapelier's *vahimantsy* as *Paederia thouarsiana* Baillon (Rubiacées), and a *vahimantsy* specimen collected by Philippe Beaujard (personal communication) among the Antemoro is *Paederia thouarsiana* H. Bu.

22. Boiteau (1999 III:29) incorrectly associates the dye term *moàna* with the Malagasy word for silent or mute, *mòana*. The difference in syllable accent, however, precludes any relation between the two. Might the term be derived from *mhina* ou *muhina*, the Swahili term for henna (*Lawsonia inermis* Lythraceae) (Gabriel Lefèvre, personal communication) ? It is possible, although the henna plant is a tall shrub or small tree whose leaves provide the reddish dye, whereas the Malagasy *moana* is described as a large forest tree whose root provides the dye. Could it be *morana*, which Poisson (1940 :60n10) gives as a Hova term for the east coast *honitra*, a Rubiaceae ?

23. Abinal and Malzac 1888 : « *moany* or *moano*, arbre qui sert à faire une teinture jaune. »

24. The Ombiasy employs archaic orthography: *sarikia* for the modern *sarika*, *aikia* for the modern *aika*, etc.

25. aira AM, era aira MN.; maintisina corr., maintsina Mss

26. The measurement *dia* refers to actual human feet from heel to toe, not the English 12 inches.

27. The term *iray loha* employed by the Ombiasy–which today denotes « element » or « ensemble » – is unknown to us but appears to refer to a skein (*ira*).

28. alaina MN, aloina AM.

29. lena MN, lina AM.

30. azo MN, hazo AM; volavolaina corr., volavolavolaina Mss.

31. lahasa corr., lahaja Mss.

32. tsaratsara corr., tsatsara Mss.

33. ny foly MN, sy ny foly AM.

34. maintim-potaka MN., mainty-potaka AM.

35. ranom-boasary corr., ronom-boasary Mss.

36. Malzac and Abinal define *voasary* as lemon. Today, the term *voasary* in Imerina is used for oranges, while lemons are referred to as *voasary makirana*.

37. indimy corr., indriny Mss. ; vao antitra MN, voantitra AM.

38. alaina MN, halaina AM. ; mangotrakotraka MN, mangotra akotraka AM. ; mangotraka corr., mangotroka Mss.

ABSTRACTS

One of the most crucial steps in producing a beautiful cloth, dyeing has been regrettably neglected in studies of Malagasy textiles. Several recent works have greatly added to our knowledge of Madagascar's dye plants, but much field research remains to be done on both botanical and ethnographic levels. Historic sources represent another important source for (re)capturing this knowledge. This article aims to introduce and make accessible the dye recipes recorded in four sources written by Merina authors and/or in the Malagasy language before 1900. It introduces the authors and compares their recipes to one another and to select European sources. Special attention is given to one particularly valuable text that has largely been overlooked, the " Ombiasy's manuscript. " Written from 1864-1870 by a former diviner-healer (*ombiasy*) to Queen Ranavalona I, it describes many aspects of Merina cultural and economic life, and includes long passages on fiber preparation and weaving. The article summarizes the Ombiasy's recipes for textile dyes and presents an English translation of the relevant passages.

La teinture, une étape pourtant essentielle dans la fabrication d'une belle étoffe, a largement été négligée dans les études sur les textiles malgaches. Plusieurs travaux récents ont fait avancer nos connaissance sur les plantes tinctoriales de Madagascar, mais beaucoup reste encore à faire sur les plans botanique et ethnographique. Les sources historiques représentent une autre source importante dans la (ré)acquisition de ces savoirs. Cet article cherche à introduire et rendre accessibles les recettes tinctoriales issues de quatre œuvres écrites par des auteurs merina, et/ou en langue malgache avant 1900. Après une présentation des auteurs, il compare leurs recettes entre elles et avec celles tirées de quelques descriptions européennes pertinentes. Une attention particulière est également portée à un texte particulièrement précieux et peu connu, le " Manuscrit de l'Ombiasy ". Rédigé entre 1864 et 1870 par un ancien devin-guérisseur (*ombiasy*) de la reine Ranavalona I, il décrit de nombreux aspects de la vie économique et sociale de la société ancienne merina, y compris la fabrication des étoffes, à laquelle il consacre de longs passages. Notre article résume les recettes de l'Ombiasy concernant les teintures pour textiles, et fournit une traduction en anglais des passages concernés.

INDEX

Subjects: anthropologie, ethnomédecine
Mots-clés: guérisseur -- Madagascar, ombiasy, plantes tinctoriales -- Madagascar, textiles et tissus -- Madagascar
Keywords: Anthropology, Dye Plants, Healers, Madagascar, Textils Fabrics, Traditional Medicine